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CACTUS AND SUCCULENT JOURNAL

Of the Cactus And Succulent Society Of America

Vol. XXII SEPT.-OCT., 1950 No. 5

FIG. 51. Flower of *Nyctocereus chontalensis* sp. nov., x 0.6

CACTUS AND SUCCULENT JOURNAL

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Vol. XXII SEPTEMBER-OCTOBER, 1950 (PRICE 50c) No. 5

A New Nyctocereus from Southern Mexico ..... E. J. Alexander 131
Balance in Nature ..... Dr. Louis E. Blanchard 134
Cereusly Speaking ..... John E. C. Rodgers 139
Notes on Haworthias ..... J. R. Brown 140
The Succulent Spurges ..... H. Jacobsen 142
Nova genera et subgenera ..... Curt Backeberg 153
Heliocereus Travel Notes ..... T. MacDougall 155
Spine Chats ..... Ladislaus Cutak 159

PIKE'S PEAK OR BUST

That's what they used to say. To all loyal cacticians it will be "Denver or Bust" in 1951. Remember it's July 10-12, 1951, for our Convention with two days of field collecting and sight seeing afterward.

Your Chairman spent the twelfth of July in Lawton, Oklahoma, discussing plans with Lad Cutak, our Vice Chairman. Lad has shouldered the task of conducting an evening program, the fun session and initiation into the Ancient Order of Cactus Nuts. A fine handling of these events is assured, with fun for everybody including the victims. The one thing that burdened our spirits was the fact that Dr. Berry was under orders to stay in bed for another month and we could only pay him short visits. He had planned to take us out in the Oklahoma Hills where un-usual cacti grow.

In Denver from the fifteenth to the eighteenth, Mrs. Gates and your Chairman were treated like visiting royalty. Seldom have we seen such a dinner as Mrs. Julis Willis, Denver Society President set before us. Later Muriel Colburn and Elizabeth Eckstein, our Local Committee members, came in with a full report of the excellent ground work they had done. Consequently it was easy to select an appropriate meeting place in Lakewood on the western edge of Denver. Almost around the corner from the meeting place are luxurious motels for lodging places. The most appropriate for various sized pocket books will be selected.

For three evenings in a row, practically the whole Denver Society met with us. First there was a trip via Golden to Buffalo Bill's grave and museum on top of Lookout Mountain and down the other side to the Puebla beside the ten thousand seat open air theatre in Red Rocks Park, where we got acquainted over a buffalo dinner. The next evening it was dinner with the Colburns followed by a regular society meeting in a palatial suburban home. Features of this meeting were the showing of a fine set of kodachrome slides furnished by our Veep, Homer Rush and the auctioning of some Lower Californian plants for the benefit of the local Society's convention fund. This small group has built up a surprisingly large convention fund. On the final evening, we saw fine plantings of hardy cacti at the Eckstein home, enjoyed a Dutch Lunch dinner there and outlined our convention plans to the whole group. Daylight hours were spent with the local committee inspecting locations and seeing the city. We prize the memories of our Denver visit and know that the hospitable folks will treat every one as well next year.

Denver is a city from which many worth while scenic attractions may be easily reached. We will tell you more about these attractions some other time though we know you cannot all share the good fortune we had in Yellowstone when we saw the Bee Hive Geyser, highest of all, and Old Faithful, fifth highest, blowing off at the same time.

We urge you to "Enjoy a tip-top vacation at our Convention in the Roof Garden of America" and there are cactus there, too. We know because we collected some on East Flat Top just a little west of Denver.

HOWARD E. GATES, *Chairman.*

OCTOBER MEETING

The Cactus and Succulent Society of America, Inc., will hold a meeting open to the public, Friday, October 20, at 7:30 P.M., in the large hall at Plummer Park, 7377 Santa Monica Blvd., Los Angeles, California.

Dr. E. Yale Dawson, the eminent botanist and plant collector, will be the speaker and will show colored slides of his recent trip to the cactus section of Cuba.

There will also be plant prizes, plants on exhibit and other plants for discussion. Bring in any plants which you want identified; someone will be on hand to answer your questions and furnish information.

Admission is free and there is plenty of free parking. Come and bring your friends for a visit with other cactus and succulent fanciers.

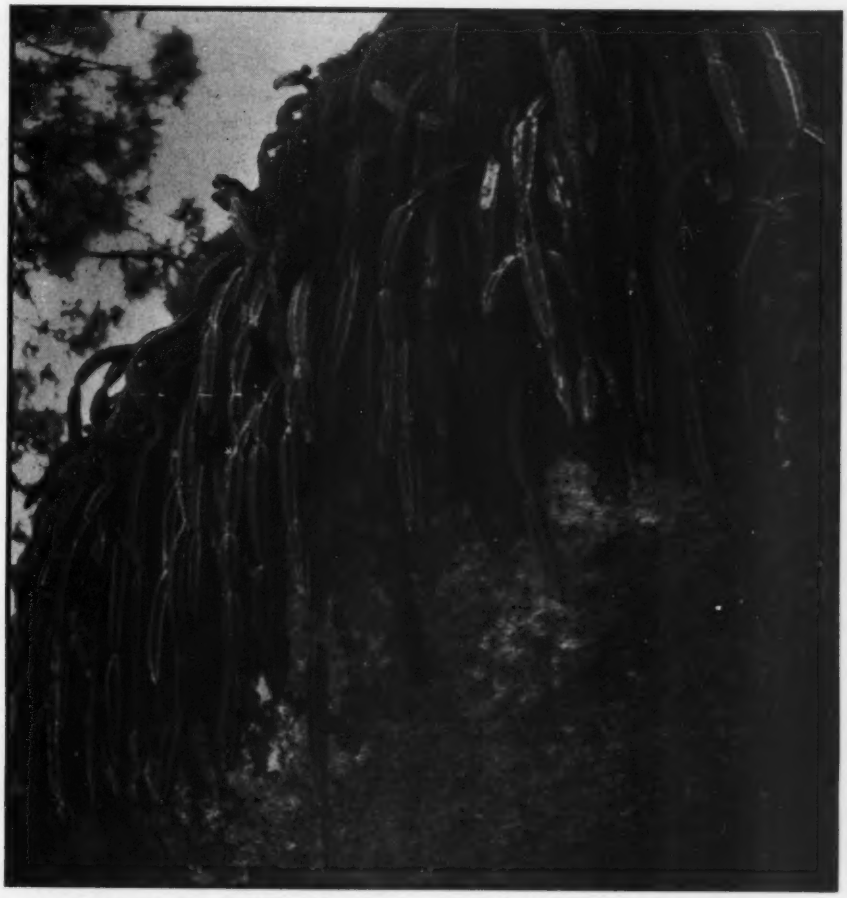


FIG. 52. *Nyctocereus chontalensis* sp. nov. in native habitat at San Juan Acaltepec.

A New Nyctocereus from Southern Mexico

By E. J. ALEXANDER, New York Botanical Garden

Photos by T. MACDOUGALL

Just west of the Isthmus of Tehuantepec and of the city of Tehuantepec is a rather isolated mountainous region populated by some thirty villages of the Chontal Indians of Oaxaca. In this area, Mr. T. MacDougall who has spent many winters exploring the region, has collected and brought back a number of new succulents and cacti. One of the more unusual cacti, bearing his field No. A44, was originally collected near San Miguel Tenango on February 15, 1940. Fruit was obtained several times, and many small potted plants raised from the seed have been sold in New York "Five and Ten" stores. Flowers seemed unobtainable although in 1946 two flowers were sent back to New York but were lost in transit. Both the fruit and Mr. MacDougall's verbal description of the flowers indicated a new species of Nyctocereus, but since the writer does not consider it advisable to describe new species without full material in hand, publication has been delayed. This past winter, in November, 1949, Mr. MacDougall obtained four flowers, and photographs of these flowers taken as they were closing at 7 A.M. It is now

possible to present this new and interesting species.

Nyctocereus chontalensis Alexander, sp. nov.

Caules pendentes vel repentes et radicantes, 1 m. vel supra longes; ramis nodibus. Caules luteo-viride, 4-5 cm. (occasio 9 cm.) diametribus, articuli 10-40 cm. longis; costae 5-6, angustae et alatae, ad 2 cm. altae, marginibus rubescentibus areolae distantes 7-15 mm., rotundis, ad apice incisurarum, lanato-canae. Spinae 5-10 mm. longae, tenues et acicularis peracutis, juvenes stramineis, senibus atro-brunneis, radialis 5-7 et centralis 1-4, occasio setibus paucibus. Flores 6-8 cm. longis, infundibuliformes, fragrantissimes, limbus patens, exteriores purpureis, interiores albae. Ovarium 10 mm. longis, tuberculatis, squamae deltoideae 0.5-1 mm. longis, axiles lanatae et ferentes pilis albo-canescentis. Tubus 20-36 mm. longus, squamae ovatae 1.5-5 mm. longae, piliferae. Limbus 25-38 mm. longus, lobis lanceolatis vel linearis, acutis. Stamina numerosis, 4 mm. longis. Pistil 22 mm. longis, stigmata 5. Fructus globosus corpus 1-2 cm. diametris, setibus luteis senibus aureo-brunneis. Perianthus marcescens. Semenes pallido-brunneis, 3 mm. longis.

Nyctocereus chontalensis Alexander, n. sp.

Stems pendent or sprawling, to 1 m. or more long, rooting on the undersurface and usually branching at the nodes. Stems light yellow-green, coated with a whitish wax, usually 4-5 cm. in diameter, occasionally to 9 cm. in robust plants, the joints or internodes 10-40 cm. long. Ribs 5-6 narrow and wing-like, up to 2 cm. high (average 15-17 mm.), the wing edges reddish tinged. Areoles 7-15 mm. apart, circular, slightly sunken at the top of the stem-notches, with dirty white felt; spines 5-10 mm. long, slender and very sharp-pointed, very weak and flexible when young, in age becoming needle-like, the first year straw-colored, then light brown and finally blackish-brown, 5-7 radial and 1-4 central, the centrals slightly stouter, in robust growth 3-4 fine bristles are at the lower part of the areole. Flowers 6-8 cm. long, extremely fragrant, unevenly rotate at anthesis, the outer perianth lobes project irregularly downward as well as outward, the inner lobes irregularly upward as well as outward, the perianth tube, ovary and the outer perianth lobes purple. Ovary 10 mm. long, tuberculate with many deltoid scales 0.5-1 mm. long, their axils felted and bearing numerous coarse, grayish-white, curled hairs. Tube 20-36 mm. long, bearing numerous ovate scales 1.5-5 mm. long, their axils also felted and bearing coarse grayish-white hairs. Perianth-limb 25-38 mm. long, outermost lobes lanceolate, 8-10 mm. long, thence increasing in length, inner lobes whitish, lanceolate to linear, tapering to an acute tip. Stamens numerous, 4 mm. long, attached in several series along the upper 15 mm. of the inner walls of the tube, from which they project at an acute angle, filaments whitish, anthers yellow. Pistil 22 mm. long, with 5 partly spreading stigmas (Mr. MacDougall notes that the style extends 7 mm. beyond the stamens at anthesis, but is back in place below the stamens when the flower closes).

FIG. 53. Seedling showing stem and spine structure. Approx. x 0.75

FIG. 54. Fruiting stems of *Nyctocereus chontalensis* sp. nov. showing the persistent perianth. Fruit approx. x 0.2

Tube funnelform, 7 mm. in diameter at the base, widening to 10 mm. at the base of the perianth-lobes. Fruit globular, the body 1-2 cm. in diameter, with a thin but tough reddish skin and a juicy, green, scented pulp; completely covered with clusters of numerous yellow bristles which eventually become golden-brown, these bristles are about 10 mm. long, and arise from large woolly areoles. Perianth withering persistent, seeds obovoid, 3 mm. long, about 50 in number, with a smooth light brown coat, ob-

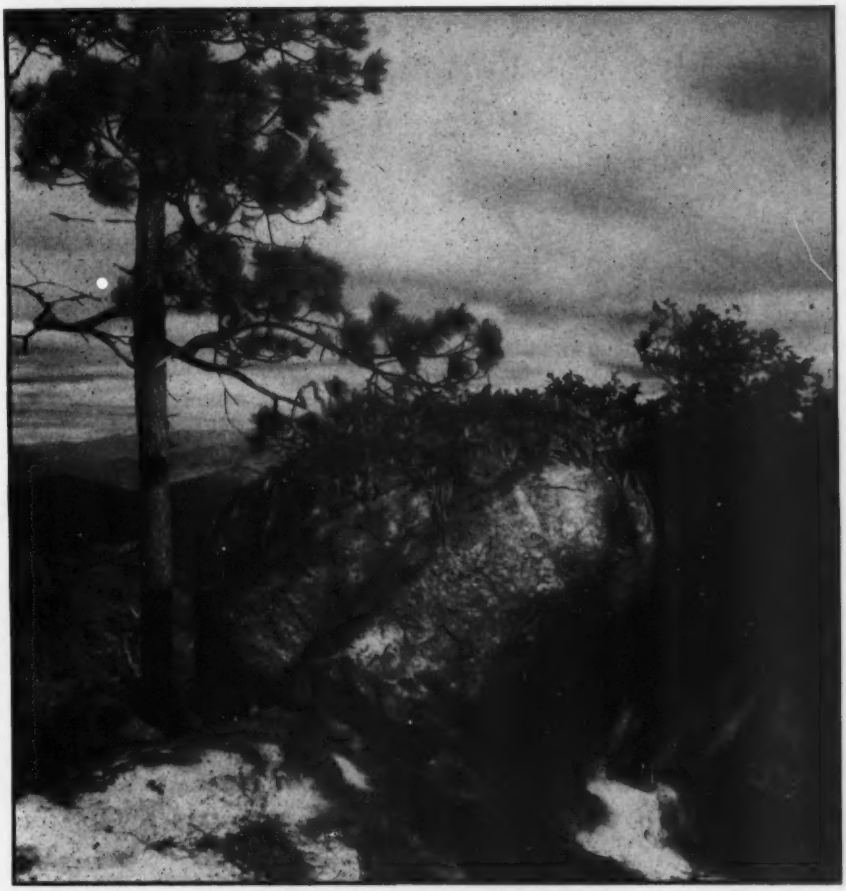


FIG. 55. Habitat of *Nyctocereus chontalensis* sp. nov. Note colony of plants on top of the large rock.

liquely attached. Type, collected Nov. 26, 1949, San Juan Acaltepec, Oaxaca, Mexico, by T. MacDougall, deposited in Herbarium of the New York Botanical Garden. The habitat pictures and the one of the fruiting pads were taken at San Juan Acaltepec, the flowers are on pads collected in bud at the same locality.

Nyctocereus chontalensis differs from all other known species of *Nyctocereus* in its few (5-6) ribs, and its extremely short style.

The species is named for its occurrence in the territory of the Chontal Indians of Oaxaca, where it has been observed in 24 different localities, all but 4 of which are in the territory of Chontal villages. The known localities are all between 2500 and 6000 ft. altitude and in an area where the dominant vegetation is pine and oak. The plants have always been found growing on rocks, never on the ground nor in trees, and seem to prefer partial shade, although they grow in the sun, but are less robust. The plant is not uncommon along the Pan-American Highway in the area of portillo de Nejapa—somewhat more than halfway from Oaxaca to Tehuantepec.

For additional illustrations see Journal XVIII, Oct., 1946, pg. 147-149.

FROM FLORIDA

As a very new member, I want you to know how much I have enjoyed my journals. We have a few ornamental cacti on our porch, but my pride and joy is an outdoor rock garden. This is always at its best during the winter months. In the summer I shade the plants with palmetto fronds stuck into the earth and water only enough to keep plants alive. In the fall I reset plants (and rocks) and add new soil. I have about 7 varieties of Kalanchoe, different Aloes and Euphorbias and Bryophyllums and some succulents as yet name undiscovered.

MRS. GEORGE B. DAVIDSON, West Miami Beach.

BALANCE IN NATURE

By Dr. Louis E. Blanchard

With the dynamic touch of spring, the dormant fields and deserts turn to active life. Wild flowers in a spectacular succession of bloom, present an exquisite colorful pageant that lasts until frost. This lavish display of sublime beauty in tranquil surroundings, represents one of nature's magical achievements. It is a colossal victory in the miracle of life, and as these dauntless plants have solved the mystery, they cheer us with their glory and fragrance.

Consider the problems of a garden—its success depends on proper nutrition, cultivation, and sanitation; constant vigilance is essential to combat the many adversities. When successful, it represents a victory of which we are justly proud; yet nature accomplishes all this without the aid of cultivation, additional fertilizers, or pesticides. If nature's methods are inviolable, then our efforts are the penalties of transgressions. Here are two methods diametrically opposed; yet each seems to serve its purpose adequately. If nature represents balance, then cultivation would imply imbalance. Let us compare such vital factors as nutritional and immunological problems in these systems.

In nature, organic material is reduced to *humus* by an intricate, biochemical process. This complex, dark-brown, insoluble material is colloidal in character and is composed of nitrogenous compounds in the form of ligno-proteinates. Humus has a high water-holding capacity and improves the soil structurally. Its presence also increases the soil's ionic exchange capacity and is a source of nitrogen for plants. It slowly decomposes under favorable conditions of temperature and microbial activity, liberating available nitrogen for plant growth. Its ability to attract nutrients and to hold its nitrogen in an insoluble form until needed, is one of its most valuable properties.

This feature prevents nutrient losses by leaching. It has taken many years to produce sufficient humus for adequate growth, and as it undergoes changes, it is constantly replaced by decomposing organic material from plant residues. The decaying plant tissues also form an organic mat that prevents erosion and excessive oxidation, thereby conserving the soil's energy. By these methods, nature has provided the essentials of adequate yields. Its nutritional levels are conducive to growth with the production of a large amount of seeds or numerous small fruits; such response provides security where reproduction is the prime objective.

The viability of seeds is variable; some are capable of germination at maturity; others require a resting period until the following season. There are records of germination after forty or more years, with an extreme case where lotus seeds buried in peat for about 200 years, were still viable. Generally speaking, germination after 10 years is a rarity; most seeds from plants in cultivation, retain their maximum vitality for the following season. Growers have found it profitable to use such fresh seeds. The reports of germination of wheat over 3000 years old from a sealed Egyptian tomb, must be considered as fantastic.

In cultivation, the tilling of the soil removes the natural mulch of dead organic material and increases the evaporation loss. Oxidation by excessive soil ventilation, reduces the humus faster than it is formed; crop removal does not allow adequate return of organic material to the soil. Striving for larger blooms or fruits, also calls for more nutrients. This is a direct reversal of the methods and objectives of nature; so adequate fertilizers must be added to the soil to compensate for the induced deficiencies. Soils under active cultivation require a continuous return of organic material to alleviate these impositions. A virgin soil is well-balanced; it was built by nature during the ages. Heavy continuous cropping with indifference to organic restoration, soon produces an unbalanced and unnatural soil condition.

Wild growth consists of a heterogeneous vegetation in a symbiotic relationship. Plants grow in certain localities, because the conditions of climate and soil are favorable for their existence. The flora is extremely variable, and its disposition is far and wide. This is due to the fluctuations in climate, soil chemistry, and water. These factors are significant in their welfare.

Nature's most vigorous weapon in combating disease, is *isolation*. A virus or fungous infection, which is usually associated with aphids and other pests, may produce serious or fatal results in a community of plants. However, the spread of such disease in epidemic proportions, would be impossible; the fungous spores or parasites would have to be transported long distances and in adequate mass, to be of serious consequence. In cultivation, the nearest approach to this na-

FIG. 56. *Neoraimondia macrostibas* var, *gigantea*. This massive slow-growing cactus of the barren Peruvian deserts, strikingly illustrates natural nutritional balance. Photo by Backeberg.

tural method of space protection is crop rotation. Pests that have developed in one season will thereby starve in the next, on account of lack of food.

Plants bred into new varieties require constant care, because they are placed in a new environment under unnatural conditions. They have been forced into rapid evolutionary changes, and have not had time to adjust themselves against diseases. This necessitates a vigorous program of special treatments for their mere existence. Such plants would indeed be short lived in natural competition.

It is interesting to note by immunological comparison, that Man occupies a similar position in his rapid evolutionary progress. In the Middle Ages, large portions of the world's population frequently perished in short periods of time because of epidemics, such as bubonic plague, cholera, and typhoid fever. Primitive therapies, such as sacrifices, incantations, and charmed potions now only have historic value. Medicine, radiography, surgery, and other sciences have made momentous progress. Improved sanitation, the etiological association of pathogenic bacteria with diseases, and the biochemical relations of glandular disturbances have advanced the lines of human progress. Natural immunity essentially lagged, as it required ample time for its production. To maintain this unnatural position, Man has developed immunological factors through biochemical advancement and is thereby able to hold his advanced position. By adequate prophylaxis with vaccines, sera and antibiotics, endless thousands have been saved. Diphtheria, typhoid fever, malaria and many other diseases have been placed under absolute control. The span of life has been definitely lengthened.

Plants in nature possess well-balanced immunological controls. It is believed by geologists and paleontologists, that early plant life on Earth antedated Man by millions of years. There has been no artificial surge in plant advancement; ample time has permitted a reënforced progress by the production of natural immunity. The parasites of plants have also suffered severe competition in their life struggles. Insects, such as the various beetles, have battled against the ravages of diseases by micro-organisms, and their numbers have been sufficiently reduced to prevent them from becoming a serious menace.

In Japan, the Japanese beetle (Popillia japonica) is not a serious threat. Its destructive activities there are similar to those of some of our native beetles. Their presence there, as with some of our beetles, though noticeable in certain localities, is not in epidemic proportion. The natural enemies of pests are the controls that permit a balanced life. The Japanese beetle introduced in America, had a free reign; they could carry on without interference; and their damage has been serious, as nature has not had the time to develop an adequate defense. Such unbalanced reactions are the results of biological surges. Any epidemic, whether in plant or animal life, represents a temporary break-down of one of nature's defense mechanisms. When balance is established by immune reactions or death of the pests because of lack of food, equilibrium is again temporarily restored, and life continues in apparent peace.

In the battle of life, the plants' greatest struggles are with the invisible foes. The great power of micro-organisms lies in their diminutive size and incredible rate of reproduction. Mutations and natural selections to suit any specific environment, fit well in their evolutionary scheme. Under ideal conditions, they can produce millions of generations in one day. It is logical to assume, that there can be no permanent immunity from the ravages of such adept parasitic life. The number of generations of plant life in a unit of time is insignificant, compared to that of bacteria and viruses. Even if a plant evolved such a natural immunity, it would indeed be only temporary; the parasities by mutations and selections would develop a variety capable of coping with the new situation. As old diseases are naturally conquered, new maladies will develop. This too is evolution; it is evolution for the parasites.

In greenhouses, the red spider mite (*Tetranychus telarius*) has a tremendous power of reproduction. It has been found that one female can produce about 20 mites in 30 days at 60°F; about 13,000 mites at 70°F; and in excess of 13,000,000 mites at 80°F.

Some specific spray compounds of recent development, at first gave perfect protection. With continual use of the same materials, there soon developed strains of mites that were immune.

FIG. 57. UPPER LEFT: Death of a tree by starvation in the competition for light. The epiphytic Florida moss (*Dendropogon usneoides*) cast a deadly shade on the leaves of its host. UPPER RIGHT: The massive rosette of the century plant (*Agave americana*) dies after producing a huge flowering and fruiting spike. This represents a contributory sacrifice for maximum seed production and security. CENTER LEFT: The banyan tree (*Ficus utilis*) produces a forest-like growth with its spectacular aerial roots. It eliminates competition by its shade. CENTER RIGHT AND BOTTOM: The strangling figs (*Ficus aurea* and *Ficus brevifolia*) of Florida. The roots cling to the palms like the coils of a boa-constrictor. They enlarge, encircle, and coalesce and may even encase its victim. When the roots are anchored in the soil, the aggressive fig grows as a tree.

Here again was an evolutionary victory for the parasites. New therapeutic agents are essential to cope with the ever changing conditions.

Success in perpetuation necessitates the production of seeds stored with highly concentrated foods and the protection by sclerified and resistant shells. Protection during dormancy and harsh climatic conditions is vital to the species. The production of seeds represents the consummation of life for all annual and certain perennial plants. Long-lived perennials, such as the *agaves* and *sempervivums,* so exhaust themselves on bearing their flowering and fruiting spikes, that they perish after their first production. This supreme sacrifice represents a contributory type of protective mechanism by an individual plant for the preservation of the species.

Time is of the essence in the competitions and struggles of wild life; unfavorable circumstances shorten its cycle for rapid seed production; procreation is the goal. The urge of reproduction is so strong, that adverse conditions followed by more favorable circumstances, may produce several crops of seeds in one season. Nature is indeed frugal.

We are accustomed to associate the struggles of life with wild animals and Man. In their battle for survival, the *strong* destroy the *weak*. The eagle swoops down and carries off a screaming song-bird in its powerful talons; the cunning fox tracks the hapless rabbit; a hunter's bullet lays its victim low. This is the way of life; it is harsh and ruthless; it is nature.

Surely such behavior would seem incongruous in the apparent peace and transquility of plant life. The fields and forests in their brilliant splendor seem to reflect the utmost in harmony and tranquility; however, such utopian existence is strictly imaginary. Plants battle for light; it is a fight to the finish. The conqueror, by taller growth, silently and successfully casts a deadly shade over his rival. This warfare is grim and decisive; without light there is no photosynthesis; there is only death by starvation for the conquered.

The methods and implements of plant warfare are variable. The strangling figs (*Ficus aurea* and *Ficus brevifolia*) of Florida dispatch their hosts in a most dramatic manner. These jungle killers usually start as epiphytes, sprouting from seeds dropped by birds on the rough bark of trees. The smooth roots grow downward, clinging tenaciously for support like the coils of a boa constrictor. The branching roots enlarge, encircle, and coalesce and at times completely encase the victim's trunk. The hard-wood trees are slowly but surely strangulated within their fatal embrace. When their roots are anchored in the soil, the aggressive figs grow as trees.

Palm trees frequently survive these constricting attacks, owing to the characteristic anatomical structure of their stems. As palms are monocotyledons, the structure of their trunks is somewhat similar to those of cornstalks. The maximum diameters are early attained and remain quite uniform. The coarse wiry vascular bundles in a spongy parenchyma fill their columnar axes, and external pressure produces no complete occlusion of the vascular system.

In hard-woods, the vascular system is in the thin cambial layer beneath the bark; such victims are placed under a terrific pressure because of secondary annual growth against the tension of the coils of the strangling figs. There is no compromise in these struggles; the solution is death to the hosts.

The banyan tree (*Ficus utilis* or Zulu fig), a native of tropical Asia, thrives in central and southern Florida. Its manner of growth is most spectacular. Aërial adventitious roots from massive horizontal branches penetrate the soil, create new supports, and assume root functions. There are records of one tree producing several thousands of such trunks and covering over an acre of ground. The leathery, lustrous, evergreen foliage enhances the tropical splendor of its forest-like growth. With the mighty spread of its verdant broad-leaved canopy, this picturesque tree eliminates all competition by its deadly shade.

By mowing lawns and roadsides, we become allies to such rosette fighters as dandelions and plantains. With taller competitive growth mowed down, the dandelions take possession in a decisive victory. Their flat rosettes quickly spread out and eliminate further competition by their ominous shade. With countless blooms, they flaunt their golden victorious banners in massive array. In adjacent unmolested fields and neglected lawns, where competition is keen, they may be absent or exist in limited numbers.

Florida moss (*Dendropogon usneoides*), a member of the Pineapple Family, is very abundant in some of the southern states. Its gray lacy pendants, swaying on the glorious giant live oaks and bald cypresses, are magnificently picturesque. These epiphytes at times asphyxiate their hosts in the competition for light; they also become a menace when they drape the citrous groves. This moss is now used as packing, in the manufacture of furniture.

Plants also compete for water and mineral salts. In the desert, individuals or species with the most efficient root systems are the survivors.

The scarcity of food and water promotes unusual compensatory root growth for maximum efficiency. Haselton has described and illustrated such an unusual relationship. A cactus (*Opuntia echinocarpa*) less than two feet tall and one and one-half inches in diameter, developed primary roots over thirty-five feet long; and this definitely only represented a small fraction of the secondary root system. When several species are in proximity, root competition is diminished by its growth at different ground levels. Because of insufficient water, species in the desert are not crowded, as seedlings cannot thrive close to established plants.

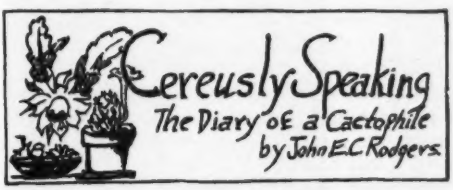
The protean adaptations of desert flora, with its fascinating xeromorphic anatomical changes, are mechanisms essential in the life of such plants for proper balance. Various species possess structural modifications best suited for their particular environment.

The competition for light represents a constant struggle; however, some plants have so anatomically altered their structures as to tolerate shade. The number of stomata in the leaves of plants such as impatens and begonias, are considerably reduced. This lowers their respiratory activity and lessens their photosynthetic capacity. Such altered mechanisms can only operate efficiently with reduced light. Excessive illumination would disintegrate chlorophyll faster than its synthesis, and the plant would be short lived or struggle for its mere existence in an unbalanced state. A colony of plants, growing in friendly proximity, is made possible by such adaptations. Symbiosis is only possible when the species present mutual benefits and can operate profitably. It is one of the most striking of natural adaptations, and it has made possible the complex flora of our forests and jungles.

Nature does not pamper her subjects. Weakness is not tolerated and calls for replacement by vigorous competitors. Plants in any community have fought for their position and have adapted themselves to the conditions of their particular habitat. The battle to maintain supremacy never ends. Peace and harmony are ephemeral. Nature does not permit a static life.

REFERENCE

Haselton, S. E., "Desert Observations," *Cactus and Succulent Journal*, XXI:54-55, 1949.



Aeoniums belonging to the Sempervivoideae of the Crassulaceae (Orpine family) contain 36 true species and numerous hybrids. Cousins to the garden—hardy Sempervivums (hens and chickens) the Aeoniums are not hardy to the colder climates, so they must be protected from frost and freezing temperatures. The Aeoniums, unlike the Sempervivums, do not have ground-hugging rosettes but invariably develope rosettes at the end of mostly naked stems. The leaves may be fringed with minute teeth, covered with velvety plush, slightly hairy, smooth glossy green, or covered with a waxy bloom of blue green, reddish brown or apple green. They vary in size from the 3 foot *Aeonium arboreum* to the smallest not over six inches tall such as *Aeonium sedifolium* and *A. Lindleyi*.

Although most dealers do not list many of the Aeoniums as such, most of the species and hybrids listed in "Succulents for the Amateur" are available. I secured most of the ones I own from collectors of long standing in and around Cleveland, Ohio. The local names are most descriptive as well as quite apt. *A. decorum* is called "green roses." *A. arboreum* and its variety *Atropurpureum* are called "green and purple palms." *Aeonium Haworthii* is called "Blushing-green rose" while *A. tabulaeforme* is called the "plate cactus."

Most Aeoniums are supposed to bloom in early spring or late winter but the ones I've seen in bloom are during late spring and summer. *Aeonium sedifolium* blooms for me from early August through most of September while *A. arboreum* and variety blooms in early May and June. *A. Lindleyi* is a prolific bloomer during the entire summer. The others I own—*A. caespitosum* and its hybrid *A. caespitosum* x *spathulatum* (called *A. Tournefortii*), *A. decorum, A. Haworthii, A. "Lazerotense," A. spathulatum,* and four or five I've not been able to identify other than they may be hybrids of *A. sedifolium, A. Haworthii,* etc., since they do have the 8-10 petal flowers of the Aeoniums.

Like others of the Crassulaceae there are a few diseases and insects that seem to enjoy the bill-of-fare-a-la-Aeonium. Mealy bugs do not attack all species of Aeonium (at least those I own) but they do *A. sedifolium, arboretum* and hybrid; and *Lindleyi* which cause them to lose their lower leaves (or stick together in sticky masses which attract ants). They stand neglect well. Heat does not bother other than defoliate them to retard evaporation. For me they do best in partial shade. Lack of rarer elements in the soil cause yellowing of the foliage. The color of the leaves can be changed back to green by the use of one of the complete fertilizers. Black and green aphids often lay their eggs in the plants while they are outside during the summer. These hatch out early the next spring and make a breeding place for black fungus (soot type), and a cafeteria for ants (aphids are often called ant-cows). A brown-surrounded-by-yellow tissue-fungus often attacks the Crassulaceae but it seldom attacks the larger leaved Aeoniums as far as I can find. Most of the diseases clear up if the plants are kept clean and given good soil.

While most of the 36 species of the genus Aeonium are found in the Canary Islands (often called the Canarian Sempervivums), they are also found in

Maderia Morocco as well as other regions bordering the western part of the Mediterranean. Here too grow numerous shrubby Euphorbias, Aloes, Carralumas, Huernias, Echidnopsis, Kleinias, and columnar Cereopegias. They grow among the weathered rocks at the base of cliffs and in the dry rich soil bordering the ocean. There is "great heat and drought in summer aggravated by strong winds." The rainy season occurs during our winter which gives this region its mild climate enjoyed by the northern Europeans when they go to the south of Europe.

Since Aeoniums belong to the leafy succulents it is well to use a moderately rich porous soil of sand and loam. I use the same soil for Echeverias, Aloes, Crassulas, etc., also. Most growers recommend an old soil (mixed and stored to mature). The ⅔ humus, lime rubble, etc., plus ⅓ clean sharp sand is found advisable. I use a small amount of pulverized clay thoroughly mixed into my regular potting soil (Californians use weathered granite which roughly corresponds to weathered clay in Ohio).

I've seen excellent Aeoniums in the window gardens of my travels. The plants, mostly *A. arboreum* and its variety *Atropurpureum* showed very little stem variation as to thickness from the ones I grow in my greenhouse. The color was good also, but in the species *A. Lindleyi* and *A. sedifolium* the stems became stringy and lost their color unless they were housed in a south or a west window. I grow the smaller types on my window sills because of their adaptability and the pure golden yellow of those that do bloom.

My "plant of the month" is *Aeonum Lindleyi* (see illustration page 123 "Succulents for the Amateur"). This gem from the Canary Islands has velvety dark green, much branched rosettes of oval leaves. It grows

(Continued on page 160)

NOTES ON HAWORTHIAS

By J. R. BROWN

Haworthia Schuldtiana var. **major** G. G. Smith in Journ. So. Afr. Bot. XII (1946) 1. fig. 1. & Pl. 1.

Plant stemless, simple, to 8.5 cm. in diam. and with numerous leaves.

Leaves to 4 cm. long, 12-16 mm. broad, obovate, somewhat acuminate, dark green to brownish-green; the retuse leaf faces 16-20 mm. long, usually about 18 mm., and about 14-15 mm. broad at base, somewhat convex and with numerous concolorous tubercles which are tipped with white teeth, dark green and pellucid and with 3-7 greenish-white lines, the 3 longer of which may or may not attain the apex; the tubercles extending somewhat beyond the base of the retuse leaf faces; back of leaves comparatively smooth, dark brownish-green, with concolorous or whitish-green tubercles in the upper part, keeled or sometimes doubly keeled in the upper part, the keels very acute towards the tip, and with slender whitish teeth scarcely 1 mm. in length, the teeth on the upper margins slightly longer.

Peduncle 30 cm. or more, in length, including the raceme, stout, simple, about 2.5 mm. diam., brownish-green; sterile bracts numerous (to 20), lower about 12 mm. in length decreasing in the upper to 6 mm., white, membranous, ovate-deltoid, acuminate, with a brown keel; pedicels, lowest about 2 mm. long, almost sessile above; bracts resembling the upper sterile bracts, 6-7 mm. long; perianth 14-19 mm. long, tube obclavate, almost triangular in cross section at base and here 4-5 mm. in diam., white suffused green, with brownish-green lines; segments short and scarcely spreading, 3 upper more or less erect, the lower 3 more recurved, the 2 laterals somewhat channelled, white with greenish lines; face of flower about 4 mm. in diameter.

Locality: Cape Province: Riversdale Distr. Collected by Mr. J. Dekenah on the Karroo side of Garcia Pass, 1943.

This Haworthia is larger and much more bristly appearing than *Haw. Schuldtiana* Poelln.

It would seem that there is a more or less distinct form of *Haw. Schuldtiana* Poelln. growing with the form designated as var. *major*. This is a more compact and truncately topped plant; the leaves are shorter; the retuse leaf faces are 12-15 mm. broad at the base and about the same in length, with 3 longer lines, which may or may not attain the tip, and a few very short ones; the terminal bristle and the teeth on the margins and keel shorter; the tubercles on back of leaves more whitish in color. The floral parts would seem to be identical in both forms, although some variation in the color of the perianth tube is noted, one plant having a clear whitish color, the other a dull, dingy white.

Haw. Schuldtiana var. *major* G. G. Smith of the sect. *Retusae*, is a very distinctive Haworthia. When the plants are growing vigorously in spring the retuse leaf faces may become more pellucid and shining, becoming dull however, as the drier and hotter season advances. The lines on the retuse faces may be more or less obscure or quite distinct, depending on the light conditions under which the plants are grown. The length of the perianth is given as being 19 mm., but so far I have not observed a perianth longer than 16 mm., but this may be due to conditions of culture.

The plants illustrated here were collected in the Riversdale Distr., about 12 miles N. of Riversdale just as you enter Garcia Pass from

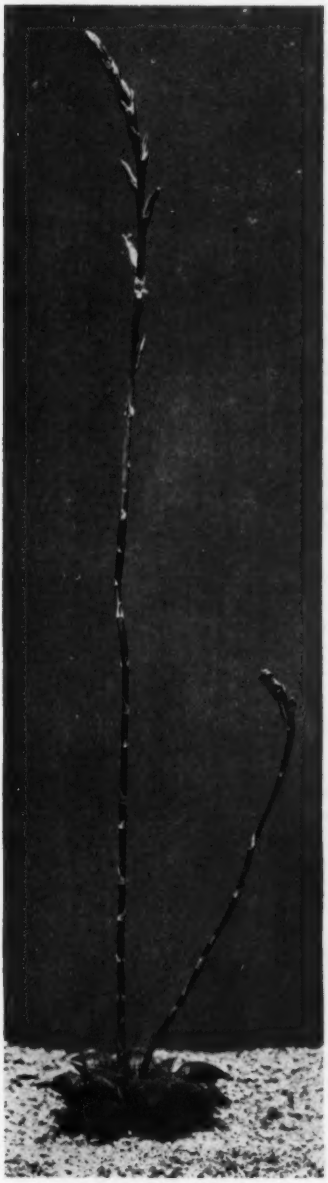


FIG. 58. *Haworthia Schuldtiana* var. *major* in flower; greatly reduced.

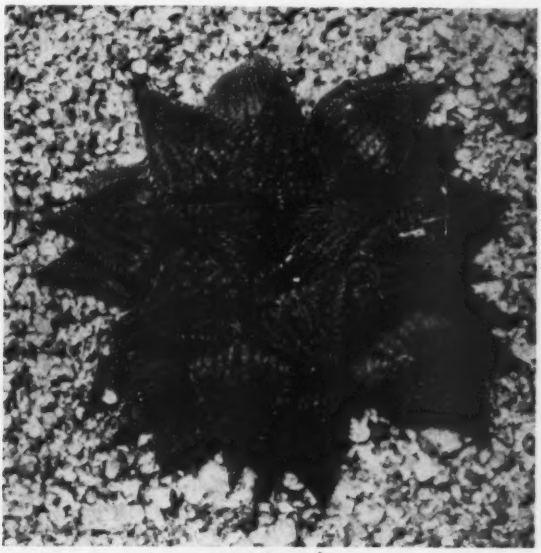


FIG. 58a. *Haworthia Schuldtiana* var. *major;* nat. size.

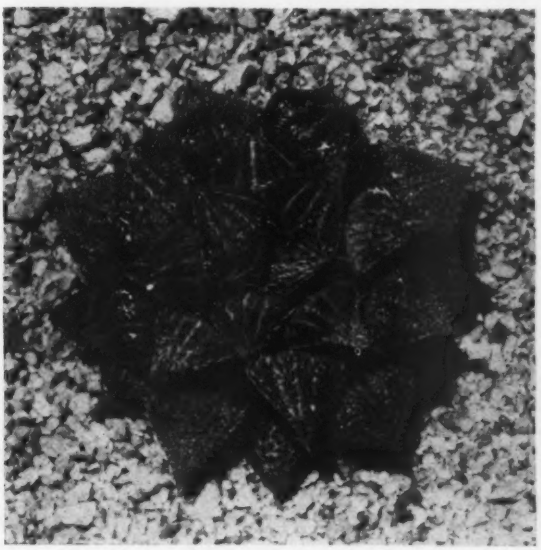


FIG. 58b. A Haworthia somewhat resembling the above; nat. size.

the N. The aspect N. and N. E. Growing singly in the rock crevices in a somewhat sandy soil and covered by other vegetation. Few of them are found growing outside of the rock crevices, and the natural dark brownish-green color of the plants makes them difficult to find in the shaded crevices of the rocks.

The upper plant and the plant in flower at left in the illustration, is *Haw. Schuldtiana* var. *major* G. G. Smith, the lower plant is the form mentioned previously. The 2 plants at right nat. size, the plant in flower greatly reduced.

THE SUCCULENT SPURGES (EUPHORBIEAE SUCCULENTARUM)

A Classification According to Morphological Characteristics

By H. JACOBSEN (Kiel)

Translated by MYRON KIMNACH

The genus *Euphorbia* is distributed over the entire earth in the form of annuals, shrubs, bushes, and trees. The milky juice which is freely exuded when the plants are injured is known in Germany as "Wolf's-milk," and is poisonous. Of the over 2000 species in the genus we are here interested only in the succulent species, which, while mostly distributed over South Africa, are also found in North Africa, Arabia, Morocco, the Belgian Congo, the Canary, Cape Verde, and Azore Islands, tropical East Africa (north to the Red Sea), Madagascar, the island of Socotra and east to the Indies; a few species also grow on the American continent, in Mexico, Brazil and on the island of Cuba.

Their appearance is the result of a dry climate with little rain, and their numerous strange growth-forms resemble those of cacti; the uninitiated often confuse these two families. As with the other succulents, the Euphorbias have become cherished and cultivated by many lovers of plants. Because of the variety of forms, the classification of the species has been difficult. For this purpose the flower characteristics are of interest, as they are the foundation for the systematic arrangement of this genus. The flowers are intricately constructed, however, and not easily explained to the beginner. As not all Euphorbias bloom regularly it is simpler for these reasons to consider only the morphological differences in determining the species.

In 1907 Alwin Berger brought out his excellent book "Succulent Euphorbias," a description, and introduction to the classification, of the cultivated species. This author divided the succulent Euphorbias into 12 sections, basing these on characteristics of the inflorescence, spines, leaves, branch forms, etc. But during the following decades there were an extremely large number of new species discovered, especially in South Africa and Madagascar, which made necessary a new treatment. Many learned botanists, as well as amateurs, dealt with these plants. Alain White, R. Allen Dyer and Boyd L. Sloane gathered together all of this work in their superb, two-volume work "The Succulent Euphorbieae" (1941). Unfortunately the authors considered only the South African species, so that today there is still no available complete work on all the succulent Euphorbias. White, Dyer and Sloane attempted the division of the South African species into 19 groups, according to the external appearance of the plant, though flower characteristics were not omitted. Each group, with a special key worked out by the authors, deals with a group of forms distinct from the others. Thus, a very useful key!

The following is an attempt to bring together all succulent Euphorbias in one arrangement, one that will enable the beginner to know and determine the plants through their exterior appearance.

For this purpose the plants may be distributed through 27 well-separated groups. If this separation proves satisfactory a special key will be constructed for each group. As far as possible the separation is according to White, Dyer and Sloane, while also being partly based on the work of A. Berger.

THE GROUPS OF SUCCULENT EUPHORBIAS

I. Spineless plants, or plants with spines formed by the persistent inflorescence or peduncle.

A. Leafy shrubs, at first succulent, later woody; or succulent shrubs, in one case a tree (Gr. 4); branches slender, wand-like, jointed, terete, flat or also angled, usually lacking tubercles which when present are distinct and separate.

GROUP 1. (*Section Tithymalus* Boiss.)
Shrubs, when young with succulent, cylindrical branches, with densely spiralled leaves, these often periodically falling; cyathia in umbels with red, violet or yellowish bracts which are either whorled or opposite.

SPECIES: *Euphorbia*—
atropurpurea Brouss.
balsamifera Ait.
Berthelotii C. Bolle
dendroides L.
mellifera Ait.
piscatoria Ait.
punicea Swartz
quadrata Nel
Tuckeyana Steud.

E. atropurpurea Brouss.

GROUP 2. (Section *Goniostemma* Baill.)

Shrubs, more or less succulent, branched in whorls, or small trees; branches thickened above, lightly angled, the angles with pectinate stipules; leaves large, petioled, pinnately veined.

SPECIES: *Euphorbia*—
Commersonii (H. B.) M. Den.
lophogona Lam. (E. Fournieri Hort.)
orthoclada Bak.
epiphylloides
pyrifolia Lam.

E. lophogona Lam.

GROUP 3. (Key 1 of W. D. S.)

Woody shrubs; branches smooth, or rough from the more or less prominent cushion-like remnants of small suppressed flowering branchlets, spineless or with ends of branches spine-like.

SPECIES: *Euphorbia*—
espinosa Pax.
frutescens N. E. Br.
Guerichiana Pax.
matabelensis Pax.

E. frutescens N. E. Br.

GROUP 4. (Section *Arthrothamnus* Boiss.; section *Lyciopsis* Boiss.; section *Tirucalli* Boiss.; Key 2 W. D. S.)

Shrubs, usually dwarfed or also taller, in one case a tree; branches numerous, succulent, rarely bushy and woody, usually cylindrical, wand-like or jointed, more rarely laterally compressed, forked, branched two or three times, spineless or sometimes with the ends spine-like, smooth or rough, without tubercles, more rarely with traces of tubercles; leaves small, opposite, the branches jointed at this spot, or the leaves somewhat larger, spiral, soon deciduous.

SPECIES: *Euphorbia*—
aequoris N. E. Br.
alata Hook.
amarifontana N. E. Br.
angrae N. E. Br.
antisyphilitica Zucc.
aphylla Brouss.
arbuscula Balf. f.
arceuthobioides Boiss.

aspericaulis Pax.
brachiata E. Mey.
Burmannii E. Mey.
cassythoides Boiss.
caterviflora N. E. Br.
cerifera Alc.
chersina N. E. Br.
cibdela N. E. Br.
corymbosa N. E. Br.
cuneata Vahl.
decussata E. Mey.
Dregeana E. Mey.
enterophora Drake
ephedroides E. Mey.
fiherensis H. Poiss.
gentilis N. E. Br.
gregaria Marl.
gummifera Boiss.
Herrei W. D. S.
Intisy Drake
Juttae Dtr.
karroensis (Boiss.) N. E. Br.
Laro Drake
lactiflua Phil.
leucodendron Drake

E. brachiata E. Mey.

lignosa Marl.
macella N. E. Br.
mauritanica L.
muricata Thunb.

E. Dregeana E. Mey.

Mundii N. E. Br.
obtusifolia Poir.
oncoclada Drake
Paxiana Dtr.
perpea N. E. Br.
pseudobrachiata Dtr.
plagiantha Drake
rectirama N. E. Br.
rhombifolia Boiss.
Rudolfii N. E. Br.
sarcostemmatoides Dtr.
Schimperi Presl.
siliciicola Dtr.
spartiaria N. E. Br.
spicata E. Mey.
spinea N. E. Br.
stapelioides Boiss.
stenoclada H. Bn.
stolonifera Marl.
tenax Burch.
Tirucalli L.
transvaalensis Schl.
verruculosa N. E. Br.
xylophylloides Ad. Brogn. ex Lem.

GROUP 5. (Section *Pteroneurae* Bgr.)

Shrubs; branches succulent, angled, the angles formed by the descending leaf bases; leaves distant, of medium size or smaller, soon falling. (Species only from America.)

E. Sipolisii N. E. Br.

SPECIES: *Euphorbia*—
phosphorea Mart.
pteroneura Bgr.
Sipolisii N. E. Br.
Weberbaueri Mansf.

GROUP 6. (Section *Treisia* Haw., in part; Key 3 of W. D. S.)

Bushy shrubs much branched from the base; branches succulent with usually prominent, separate, alternate tubercles (projecting leaf-bases or podaria); leaves small, soon falling; peduncles deciduous.

E. hamata (Haw.) Sweet.

SPECIES: *Euphorbia*—
gariepina Boiss.
Halleri Dtr.
hamata (Haw.) Sweet.
peltigera E. Mey.
Schaeferi Dtr.

B. Low-growing plants, the roots tuberous or thickened and united with the main branch, with either serpentine, underground branches, herbaceous, leafy branches, or short leafy stems.

GROUP 7. (Key 4 of W. D. S.)
Plants with tuberous or thickened roots, and a main stem which is simple and completely buried in the earth, or with two or more serpentine underground branches which develop a number of herbaceous leafy stems above ground.

SPECIES: *Euphorbia*—
Gueinzii Boiss.
multifida N. E. Br.
pseudotuberosa Pax.
trichadenia Pax.

E. trichadenia Pax.

GROUP 8. (Key 5 of W. D. S.)
Plants with tuberous or thickened roots and a main stem which is completely buried in the earth, forming a short stem above, simple or branched, with a number of deciduous leaves aboveground

SPECIES: *Euphorbia*—
crispa (Haw.) Sweet.
Ecklonis (Klotzsch. et Garcke) Hassl.
pseudohypogaea Dtr.
silenifolia (Haw.) Sweet.
tuberosa L.

E. tuberosa L.

C. Dwarf, or occasionally slender, bushes, the aboveground stem and branches highly succulent, with more or less distinct, flat or prominent, densely placed tubercles, often angled, with or without thorny peduncles.

GROUP 9. (Section *Treisia* Haw., in part; section *Pseudoeuphorbium* Pax.; Key 6 of W. D. S.)
Dwarf or shrubby succulents, or one species sometimes tree-like; stem succulent, thickly set with spiral podaria (projecting leaf bases); leaves clustered into a tuft above, or there arise from the axils of the podaria long herbaceous shoots, these often with an umbellate branching above which is often forked, dying down, with alternate leaves; peduncles from the axils of the podaria, drying and persistent.

SPECIES: *Euphorbia*—
bubalina Boiss.
bupleurifolia Jacq.
clandestina Jacq.
clava Jacq.
cylindrica W. D. S.
Monteiroi Hook. f.
oxystegia Boiss.
pubiglans N. E. Br.

E. bupleurifolia Jacq.

E. Monteiroi Hook. f.

GROUP 10. (Key 7 of W. D. S.)

Dwarf, or somewhat bushy, succulents, the stem succulent, thickly set with spiral podaria, more or less branched; leaves mostly linear, folded; some or all of the peduncles persistent and drying to thin or curved spines.

E. loricata Lam.

SPECIES: *Euphorbia*—
Eustacei N. E. Br.
loricata Lam.
multifolia W. D. S.

GROUP 11. (Key 8 of W. D. S.)

Erect succulent plants, dwarfed or up to 1.20 m. high; main stem little, or not at all, branched, with rather prominent, thickly set tubercles; these with a depression or slit on the upper side from which arise the peduncles, or the tubercles without these depressions and the peduncles arising from the axils of the tubercles; peduncles persistent and drying.

E. Schoenlandii Pax.

SPECIES: *Euphorbia*—
fasciculata Thunb.
restituta N. E. Br.
Schoenlandii Pax.

GROUP 12. (Section *Treisia* Haw., in part; Key 9 of W. D. S.)

Dwarf succulents, the main stem mostly underground, the upper part covered with short branches that appear aboveground, the truncate tips forming a thick cushion; branches with distinct tubercles; peduncles falling.

E. clavarioides Boiss.

SPECIES: *Euphorbia*—
clavarioides Boiss.

GROUP 13. (Section *Pseudomedusae* Bgr.; Key 10 of W. D. S.)

Dwarf succulents; main stem thickened clavately above, often completely buried in the earth, the surface covered with a radiating series of branches, the latter with distinct tubercles; branches dying with age; inflorescence sessile or shortly stalked, peduncles on the main stem apex or along the branches, deciduous.

E. pugniformis Boiss.

SPECIES: *Euphorbia*—
Ernestii N. E. Br.
Flanaganii N. E. Br.
Franksiae N. E. Br.
gatbergensis N. E. Br.
gorgonis N. E. Br.
pugniformis Boiss.
Woodii N. E. Br.

GROUP 14. (Section *Medusae* Haw., in part; Key 11 of W. D. S.)

Dwarf succulents, the main stem almost completely buried, and usually covered at the apex with spiral, densely set series of long serpentine branches, or the main stem entirely underground and with a few or more aboveground branches, these thickly covered with tubercles; leaves small, deciduous; peduncles few, on the tips of the branches, scarcely over 10 mm. long, falling or persistent.

E. inermis Mill.

SPECIES: *Euphorbia*—
Bergeri N. E. Br.
Bolusii N. E. Br.
caput-medusae L.
colliculina W. D. S.
confluens Nel
Davyi N. E. Br.
duseimata R. A. Dyer
esculenta Marl.
fortuita W. D. S.
hypogaea Marl.
inermis Mill.
maleolens Phill.
Marlothiana N. E. Br.
Muiri N. E. Br.
pseudoduseimata W. D. S.
ramiglans N. E. Br.
tuberculata Jacq.
tuberculatoides N. E. Br.

GROUP 15. (Section *Medusae* Haw., in part; Key 12 of W. D. S.)

Dwarf succulents, the main stem spherical or nearly terete, aboveground or usually projecting from the ground, with stiff branches, or the main stem divided below ground into 2 or more stem-like branches which are further shortly branched, the branches often so numerous that together they form a thick cushion; stems thickly covered with spiral tubercles; peduncles one or more, up to 7½ cm. long, usually near the apex of the branches, persistent; some species, for example *E. arida,* closely resemble the next group.

E. pentops Marl.

SPECIES: *Euphorbia*—
albertensis N. E. Br.
argillicola Dtr.
arida N. E. Br.
baliola N. E. Br.
Bergii W. D. S.
brakdamensis N. E. Br.
Braunsii N. E. Br.
brevirama N. E. Br.
crassipes Marl.
decepta N. E. Br.
filiflora Marl.
Friedrichiae Dtr.
fusca Marl.
hopetownensis Nel.
inornata N. E. Br.
marientalis Dtr.
melanohydrata Nel
multiceps Bgr.
namibensis Marl.
Nelii W. D. S.
orabensis Dtr.
pentops Marl.
Rangeana Dtr.
rudis N. E. Br.

GROUP 16. (Key 13 of W. D. S.)

Dwarf succulents; the main stem thick, growing aboveground, usually spherical or cylindric, covered with distinct tubercles; branches short, conical when young, the ends lengthened when older; peduncles on the main stem or on the branches, very short or up to 12 mm. long, often resembling slender branches, persistent.

E. multiramosa Nel.

SPECIES: *Euphorbia*—
namaquensis N. E. Br.
multiramosa Nel

GROUP 17. (Section *Dactylanthes* Haw.; Key 14 of W. D. S.)

Dwarf succulents, often forming clumps; main stem underground with spherical or near spherical branches and shoots, and with spherical, clavate, or cylindric, jointed branches aboveground, or also with tuberous roots with long rhizomes and numerous, densely set, clavate, cylindrical, or also more or less spherical, branches, the latter covered with spiral tubercles; inflorescence sessile or stalked; peduncles often persistent.

E. globosa (Haw.) Sims.

SPECIES: *Euphorbia*—
globosa (Haw.) Sims.
ornithopus Jacq.
planiceps W. D. S.
polycephala Marl.
tridentata Lam.
Wilmanae Marl.

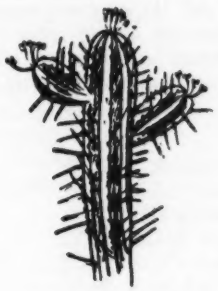
GROUP 18. (Section *Meleuphorbia* Bgr.; Key 15 of W. D. S.)

Dwarf succulents; main stem half underground, or aboveground, branched; branches arising at or above the ground, the main stem being spherical or columnar; tubercles united into continuous ribs which result in an angled body; angles 5-16; tubercles often prominent and recurved, or often scarcely noticeable; inflorescence single, nearly sessile, or branched; peduncles often hardened and persistent.

E. tubiglans Marl.

SPECIES: *Euphorbia*—
jansenvillensis Nel
juglans Compt.
meloformis Ait.
obesa Hook. f.
pseudoglobosa Marl.
Susannae Marl.
symmetrica W. D. S.
tubiglans Marl.
valida N. E. Br.

GROUP 19. (Section *Anthacantha* Lem.; section *Florispinae* Haw.; Key 16 of W. D. S.)
Dwarf or bushy succulents, partly with tuberous roots; main stem and branches terete, with longitudinal rows of tubercles (podaria) that form much divided angles; angles 6-18, more or less distinctly prominent; the sterile peduncles persisting as spines, seldom all deciduous.



E. heptagona L.

SPECIES: *Euphorbia*—
aggregata Bgr.
anoplia Stapf.
atrispina N. E. Br.
cereiformis L.
cucumerina Willd.
cumulata R. A. Dyer
enopla Boiss.
ferox Marl.
fimbriata Scop.
heptagona L.
horrida Boiss.
inconstantia R. A. Dyer
Leviana L. Croiz.
mammillaris L.
Nesemannii R. A. Dyer
pentagona Haw.
Pillansii N. E. Br.
polygona Haw.
pulvinata Marl.
stellaespina Haw.
submammillaris Bgr.
Viguieri Den.

II. Plants with (stipular) spines, these mostly in pairs, but also singly or in three's, or seldom in fours, or formed from the leaf petioles, or having an undefined origin; the spines are also occasionally undeveloped or not noticeable; the leaf bases isolated or united along the stem and branches into thick, continuous angles.

A. *Diacanthium* Boiss. Spines in pairs.

a. *Teretes.*
Stem round or only incompletely ribbed, the podaria little united; leaves well developed.

GROUP 20. (Section *Diacanthium* Boiss. 1. *Splendentes* Bgr.)
Shrubs with thin, long, diffusely arched, rather succulent branches, these round or only incompletely ribbed, the podaria not united; spines large, pointing outwards; leaves on short shoots; peduncle long, later falling; bracts red.

E. splendens Boj.

SPECIES: *Euphorbia*—
bevilaniensis L. Croiz.
Bojeri Hook.
Hislopii N. E. Br.
mainiana H. Poiss.
Milii des Moulins
(*splendens* Boj.)
platyacantha Pax

GROUP 21. (Section *Diacanthium* Boiss. 2. *Grandifoliae* Bgr., in part.)
Succulent shrubs or trees with fleshy stems and branches; podaria not entirely united into angles, so that the branches are only moderately ribbed; leaves large and robust with pinnate secondary veins and a thick middle-vein; inflorescence shortly stalked; bracts not brightly colored.

E. neriifolia L.

SPECIES: *Euphorbia*—
neriifolia L.
Nivulia Ham.
sudanica A. Chev.
Teke Schweinf.
trapaefolia A. Chev.

b. *Costatae*

Stems completely ribbed; ribs 2-13; leaves often very reduced.

GROUP 22. (Section *Diacanthium* Boiss. 3. *Scolopendriae* Bgr.; Key 17 of W. D. S.)

Dwarf succulents, not, or seldom, over 30 cm. high; stems short and thick, aboveground or half underground, often united with a thickened root; branches from the crown, radiating or erect, with or without side branches; branches with 2-4 angles which are often spiral, the podaria with spine-pairs on small spine-shields which remain single or unite into a horny margin; inflorescence from the upper flowering-eyes.

E. stellata Willd.

SPECIES: *Euphorbia*—
aeruginosa Schweick.
clavigera N. E. Br.
enormis N. E. Br.
Groenewaldii R. A. Dyer
Johnsonii N. E. Br.
Knuthii Pax.
micracantha Boiss.
persistens R. A. Dyer
Schinzii Pax.
squarrosa Haw.
stellata Willd.
tortirama R. A. Dyer
tortistyla N. E. Br.
Vandermervei R. A. Dyer

GROUP 23. (Section *Diacanthium* Boiss. 4. *Compressae* Bgr.)

Stem-forming, tree-like succulents, branching from the base, with a lengthened, angled stem; branches numerous, often arranged in whorls, compressed (two angled) and flat, often pinnately branched.

E. ramipressa L. Croiz.

SPECIES: *Euphorbia*—
alcicornis Bak.?; the species grown in gardens under this name is *E. ramipressa* L. Croiz.
Nyikae Pax.
ramipressa L. Croiz.

GROUP 24. (Section *Diacanthium* Boiss. 5. *Trigonae* Bgr., and 6. *Polygonae* Bgr.; Keys 18 and 19 of W. D. S.)

Shrubby and tree-like succulents, 30 cm. to 3 m. high; branches arising from the base of a more or less shortened main stem, with or without side branches, or with an erect stem often divided into two or more stem-like main branches; branches with or without side-branches and blooming shoots; branches 3-13 angled, the stems always many-angled, becoming more or less rounded in age; spines short, or to 5 cm. long; spine-shields with spine-pairs either separate or united; leaves large, later deciduous.

SPECIES: *Euphorbia*—
abyssinica Raeuschel
acruensis N. E. Br.
Ammak Schweinf.
angularis Klotzsch.
antiquorum L.
avasmontana Dtr.
Barnardii W. D. S.
Barnhartii L. Croiz.
Beaumieriana Hook. f.
Bothae Lotsy et Godd.
Cactus Ehrenb. ex Boiss.
canariensis L.
caput-aureum M. Den.
coerulescens Haw.
complexa R. A. Dyer
confertiflora Volk.
Cooperi N. E. Br.
curvirama R. A. Dyer
Decaryi A. Guill.
Denisiana Guill.
disclusa N. E. Br.
Echinus Hook. f. et Coss.
Engleriana Dtr.

Erlangeri Pax.
Evansii Pax.
excelsa W. D. S.
Frankiana Bgr.
fruticosa Forsk.
grandialata R. A. Dyer
grandicornis Goebel
grandidens Haw.
griseola Pax.
handiensis Burch.
(*Hermentiana* Lem.)
heterochroma Pax.
hottentotta Marl.
inarticulata Schweinf.
ingens E. Mey.
Knobelii Letty
lactea Haw.
Ledienii Bgr.
lydenburgensis Schweick. et Letty
macroglypha Lem.
neglecta N. E. Br.
neutra Bgr.
nubica N. E. Br.
officinarum L.
parciramulosa Schweinf.
perangusta R. A. Dyer
Phillipsiae N. E. Br.
polyacantha Boiss.
quadrangularis Pax.
quinquecostata Volk.
Reinhardtii Volk.
resinifera Bgr.
Royleana Boiss.
sekukuniensis R. A. Dyer
(*similis* Bgr.)
spiralis Balf. f.
subalsa Hiern.
tenuirama Schweinf.
tetragona Haw.
venenata Marl.
virosa Willd.
Volkmannae Dtr.
zoutpanbergensis R. A. Dyer.

E. Cooperi N. E. Br.

E. virosa Willd.

B. *Monacanthium* Chev. Spines single.

GROUP 25. Shrubby succulents; stem round, with tubercles in spiral rows and with one spine. (As the descriptions of the section *Monacanthium* Chev. are not available to me, I am not able to pass judgment on it. I am of the opinion that the following species belong in my group 10.)

SPECIES: *Euphorbia*—
monacantha Pax.
Sapinii De Willd.
unispina N. E. Br.
venenifera Trem.

C. *Triacanthium*. Spines in threes.

GROUP 26. Shrubby succulents; stem 5-7 angled; spine-shields with one central and two lateral small spines.

E. triaculeata Forsk.

SPECIES: *Euphorbia*—
infesta Pax.
triacantha Ehrenb.
triaculeata Forsk.

D. *Tetracanthium*. Spines in fours (2 spine-pairs). Not sufficiently known.

GROUP 27. Not sufficiently known.

FIG. 59. The type specimen of *Sclerocactus intermedius*. Diameter of stem 9 cm., not including spines, flowers pink-purple. This new species was reprinted in this Journal Vol. XXII, No. 1. Jan., 1950.

THE SUCCULENT EUPHORBIEAE OF SOUTHERN AFRICA—Alain White, R. A. Dyer, and Boyd L. Sloane. This two volume monograph on the succulent Euphorbias of Southern Africa is comparative with the three volume monograph on Stapelias by the same authors. The 1100 illustrations give this scientific work a human interest that appeals to students of this group of succulent plants. There are 19 keys, full descriptions of 197 species, a glossary, bibliography, and cultural notes. This South African flora is scientific and yet readable for the layman. Beautifully printed on the finest paper to show the many photographs to the best advantage. Two volumes contain 1000 pages 7½x10½ in., 1100 illustrations, 26 color plates. Bound in permanent Buckram cloth $12.00 per set. Postage 50c, foreign $1.25.

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CACTUS JOURNAL
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QUEEN HAS A SON

The King and Queen of the Cactus Society Convention in Phoenix last year report a son, David. Their many friends congratulate this popular, New York couple, Gerald and Beatrice Barad.

Nova genera et subgenera

By CURT BACKEBERG

Edited by E. YALE DAWSON

The following newly proposed taxonomic groups with validating Latin diagnoses (completing my Key-Synopsis to date) are presented in anticipation of the early publication in the *Cactus and Succulent Journal* of (1) a synopsis of the Cactaceae according to my latest interpretations of the classification of the family, and (2) an annotated list of my new genera, species and combinations since 1930. They will be treated further at that time.

MARNIERA gen. nov. Plantae phyllocactoideae; floribus diurnis; ovario lanuginoso. Phyllocactoid plants with diurnal, little modified flowers and ovaries provided with long hairs. TYPE: *Phyllocactus macropterus* Lemaire (1864). TYPE LOCALITY: Not cited. DISTRIBUTION: Costa Rica.

SETIECHINOPSIS gen. nov. (as a subgenus in Blätter für Kakteenf., 1938-6). Plantae humiles, cereoideae; floribus nocturnis; squamis apice saetaceo, axillis saepe saetigeris; fructu fusiformi, sicco. TYPE: *Echinopsis mirabilis* Spegazzini (1905). TYPE LOCALITY: near Colonia Ceres, Province Santiago del Estero, Argentina. DISTRIBUTION: Santiago del Estero, and also reported from western Argentina.

HELIANTHOCEREUS Backeberg

Subg. 1. **EUHELIANTHOCEREUS** subg. nov. Floribus diurnis, ex apice orientibus. Stout cerei with diurnal flowers from the apex. TYPE: *Trichocereus poco* Backeberg (1935). TYPE LOCALITY: Tupiza, Bolivia. DISTRIBUTION: Northern Argentina (boundary district) and highlands of Bolivia.

Subg. 2. **NEOHELIANTHOCEREUS** subg. nov. Ramis gracilioribus; floribus diurnis, sub apice orientibus. Low, branched, suberect cerei with diurnal flowers arising laterally near the apex. TYPE: *Cereus huascha* Weber (1893). TYPE LOCALITY: Yacutala (Catamarca), Argentina. DISTRIBUTION: Argentina.

Because of an hitherto unsatisfactory systematic arrangement, these cerei have been mistaken by various authors for *Lobivia.* Actually, they stand in intermediate position between the nocturnal trichocerei and the diurnal lobivias.

NOTOCACTUS (K. Schumann) Berger, emend. Backeberg

Subg. 1. **EUNOTOCACTUS** subg. nov. Fructu subrotundo, carnoso; a latere dissiliente 2-3 fissis. TYPE: *Cactus ottonis* Lehmann (1827). TYPE LOCALITY: Not cited. DISTRIBUTION: Southern Brazil, Uruguay and adjacent parts of Argentina and Paraguay.

Subg. 2. **NEONOTOCACTUS** subg. nov. Fructu elongato, subsicco, fistuloso, basi dilabente. TYPE: *Echinocactus mammulosus* Lemaire (1838). TYPE LOCALITY: Not cited. DISTRIBUTION: Southern Brazil, Uruguay and adjacent Argentina.

ARTHROCEREUS Berger

Subg. 1. **EUARTHROCEREUS** subg. nov. Tubo gracili, longo, axillis tenuiter lanatis. TYPE: *Cereus microsphaericus* K. Schumann (1890). TYPE LOCALITY: Ouro Preto, Minas Geraes, Brazil. DISTRIBUTION: Minas Geraes, Brazil.

Subg. 2. **CUTAKIA** subg. nov. Tubo breviore, valido, copiose lanato. TYPE: *Arthrocereus mello-barretoi* Backeberg & Voll (1949). TYPE LOCALITY: Serra de Lenheiro, Minas Geraes, Brazil. DISTRIBUTION: Serra de Lenheiro, Brazil.

HERTRICHOCEREUS gen. nov. Frutex; floribus diurnis; tubo squamoso, nudo; ovario tomentoso, interdum spina rara. TYPE: *Cereus beneckei* Ehrenberg (1844). TYPE LOCALITY: Not cited. DISTRIBUTION: Vicinity of Iguala and Rio Balsas, Guerrero, Mexico.

CARNEGIEA Britton & Rose

Subg. 1. **EUCARNEGIEA** subg. nov. Floribus diurnis; tubo axillis tomentosis; fructu interdum spinulo raro. TYPE: *Cereus giganteus* Engelmann (1848). TYPE LOCALITY: Along the Gila River, Arizona. DISTRIBUTION: Southwestern United States and Sonora, Mexico.

Subg. 2. **ROOKSBYA** subg. nov. Floribus diurnis; tubo axillis aliquid tomentosis, interdum 1-2 saetis brevibus; fructu interdum nonnullis saetis brevibus, stellariter dissiliente. TYPE: *Cereus euphorbioides* Haworth (1819). TYPE LOCALITY: Not cited. DISTRIBUTION: South-central Tamaulipas, Mexico.

MARSHALLOCEREUS gen. nov. Floribus nocturnis; ovario spinoso. TYPE: *Cereus aragonii* Weber (1902). TYPE LOCALITY: Western Costa Rica. DISTRIBUTION: Costa Rica, Pacific Coast of Mexico to Sonora and southern Arizona.

The species of this genus differ from all other species formerly of *Lemaireocereus* Britton & Rose by their spiny ovaries.

CEREUS Miller

Subg. 1. **EUCEREUS** subg. nov. Fructo maturo dissiliente. TYPE: *Cactus hexagonus* Linnaeus (1753). TYPE LOCALITY: Surinam. DISTRIBUTION: Southern West Indies and northern South America.

Subg. 2. **NEOCEREUS** subg. nov. Fructo maturo non dissiliente. TYPE: *Cereus huntingtonianus* Weingart (1932). TYPE LOCALITY: Uunknown. DISTRIBUTION: Not exactly known.

As shown by Hertrich in his Huntington Garden plant, the fruits of this subgenus do not split when mature, but shrink.

VATRICANIA gen. nov. Cephalio exteriore; floribus tubuloso-campanulinis, paulum apertis; tubo squamoso, dense lanato; stylo exserto. TYPE: *Cephalocereus guentheri* Kupper (1931) TYPE LOCALITY: at 800 m., Rio Grande Valley, Bolivia. DISTRIBUTION: Rio Grande Valley, Bolivia.

The tubular, very woolly (silky) flower which I have examined in material sent me by Cardenas from Rio Oro, Chuquisaca, Bolivia, has rather few very fine bristles and differs from all other South American Cephalocerei.

NEOBINGHAMIA gen. nov. Cephalio exteriore, anulari, gradatim alius super alium ordinato, lana laxa; floribus nocturnis, campanulato-infundibuliformibus, ex cephalio anni antecedentis; tubo paulum lanato. TYPE: *Binghamia climaxantha* Werdermann (1937). TYPE LOCALITY: Above Chosica, Peru. DISTRIBUTION: Known only from the type locality.

ASTROPHYTUM Lemaire

Subg. 1. **EUASTROPHYTUM** subg. nov. Fauce lutea; fructu apice stellariter dissiliente. TYPE: *Astrophytum myriostigma* Lemaire (1839). TYPE LOCALITY: Not cited. DISTRIBUTION: North-central Mexico.

Subg. 2. **NEOASTROPHYTUM** subg. nov. Fauce rubra; fructu basi dissiliente. TYPE: *Echinocactus asterias* Zuccarini (1845). TYPE LOCALITY: Mexico. DISTRIBUTION: Central Mexico.

DOLICHOTHELE (K. Schumann) Britton & Rose, emend. Backeberg. Filamentis spiraliter affixis; stylo tuboque supra ovarium partim coalescente. TYPE: *Mamillaria longimamma* De Candolle (1828). TYPE LOCALITY: Mexico. DISTRIBUTION: Central Mexico.

Werdermann has already suggested that the coalescent style and tube constitutes a better generic character than "ovary exserted" and has indicated that the genus should be emended with the above characteristics.

EDITOR'S NOTE: *For years we have realized the need for a complete list of Curt Backeberg's new species, new genera, and new combinations, with the date and source of publication. A year ago we asked Mr. Backeberg for such a list. Although quite an undertaking, Mr. Backeberg agreeably promised to supply this list. While in Europe last summer, Dr. Yale Dawson had the privilege of spending several pleasant and productive days with Mr. Backeberg and brought back the extensive list that will be published in this* JOURNAL. *We are sure that this list will be of great importance in the study of cacti.*

HELIOCEREUS TRAVEL NOTES

By T. MACDOUGALL

In January of 1948, through the good offices of Lad Cutak, I met the late Dr. Juan Iwersen of Mexico D.F. We soon became old friends and the doctor lost no time in suggesting that I monograph the genus Heliocereus in Mexico, adding that he would grow the plants, take photos, and, if necessary, pay for the publishing. I mention this rather to show the modest and generous character of the good doctor. What I did visualize was the collection in his garden, of splendidly grown Heliocerei (*H. speciosus* and *H. amecamensis*) and *Epiphyllanae* (including true wild *Nopalxochia phyllanthoides*) greatly augmented by our united collecting efforts.

At the time of my visit Dr. Iwersen was digging into old German writings for information on *Heliocereus Schrankii*. From these he learned that the type locality for the species is Sultepec, near Zimapán, Hidalgo. That same week-end I was Dr. Iwersen's guest on a field trip to seek *H. Schrankii* and its type locality. By mid-afternoon on the Saturday we were in Zimapán. Here we would seek directions to Sultepec and look for cultivated plants of Heliocereus, for—so we had argued—if the genus was native to the region, it would be grown or known in Zimapán. Several clues led us to *Hylocereus undatus*, and in only one home were we reasonably sure Heliocereus was even known. The

FIG. 60. *Heliocereus* sp. near San José el Pacifico, Oaxaca, Mexico. The long pistil could make this species referable to *H. Schrankii*. The glowing color of the flower is a warm shade of red, entirely lacking the violet sheen of *H. speciosus*. Background is part of our good friend Mr. G. A. Gray of Oklahoma.

FIG. 61. *Heliocereus heterodoxus* growing at approximately 9000 feet altitude, at Toniná, on Vol. Tacaná, Chiapas, Mexico. Associated epiphytes include a greenish flowered Valladia.

family there was certain we would not find it in Zimapán, but said it grew at a certain house in the nearby village of Detzaní. As for Sultepec, nobody knew of it, or of the more likely Siltepec, or of any place name suggestive of either.

The next morning we followed a narrow road, and on to the mine shafts where the road ended. Magnificent ravine and mountain scenery rewarded our search, also a strange—to me—xerophytic succulent flora. But not a Heliocereus did we see, nor indeed had there been any sign of a habitat that might harbor these, and other, upland species of epiphytic cacti.

Heliocereus Schrankii—if it exists—appears to be distinguishable from *H. elegantissimus* only by the length of the style. In Oaxaca the common Heliocerei are of this acuminate petaled group. They have styles which may or may not project beyond the stamens. The character may prove to be of little specific value here. More observations are needed.

In addition to the *H. elegantissimus*-like kinds in Oaxaca, there is one very distinct species which, at present, we know only from two spots. Still another Heliocereus-like species, (A124), of Oaxaca, has scales, in place of spines, on ovary and tube. With this "aberrant" character, authorities may not admit it to the genus.

In Chiapas, in spite of favorable terrain, I had not found Heliocereus. However, the type of the rather recently described *H. heterodoxus*,

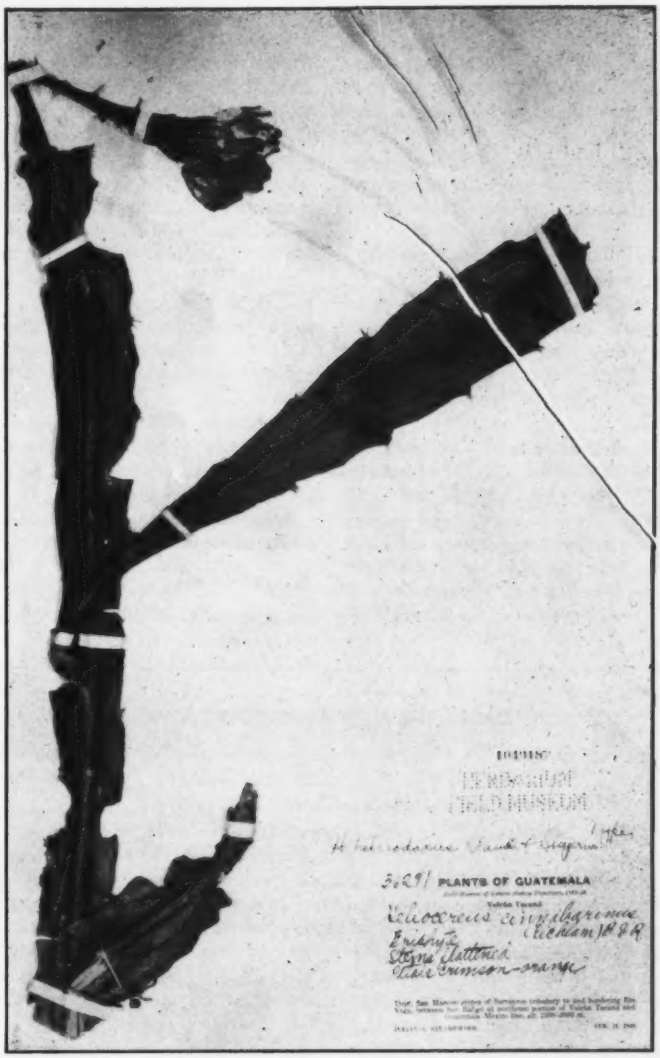

FIG. 62. Photo of herbarium specimen of *Heliocereus heterodoxus* as published in Field Mus. of Nat. Hist., 23, 1944, by Standley and Steyermark.

by Standley and Steyermark, is from the Guatemalan side of Volcán Tacaná, and its occurrence on the Mexican side was to be expected.[1] Tacaná is part of, what I like to consider, my winter habitat. It is one of the far corners though, and I had not visited there in years. Now, I would return, to collect for a Begonia specialist,[2] and there would be the welcome opportunity of once again climbing the 13,300 ft. cone, plus the expectation of finding *Heliocereus heterodoxus*. The near border town of Unión Juárez was our starting point for this adventure, with Toniná, approximately 9000 ft. above sea-level, the objective for the first day. Toniná is a mere handful of small wheat and sheep ranches. The sheep are herded away from the wheat by boys clad in thick homespun

[1]Rudolph Ziesenhenne of Santa Barbara, California.

[2]Herbarium material of an unnamed Heliocereus, collected, near the border in Chiapas, by the botanist Eizi Matuda, antedates the Standley and Steyermark collection in Guatemala—thus the type locality of *H. heterodoxus* might well have been in Mexico instead of Guatemala.

woolens. Each young shepherd carries not the traditional crook, but a long "dog" whip. The whip-lash is plaited of the soft leaves of a large unarmed maguey—Agave or Furcraea sp. Short rows of this maguey are scattered over the steep slopes and form part of the novel and pleasing scene presented by this most interesting native economy. The ranchers, I was informed, are of the nam tribe—belonging to the Mayan language stock.

As we neared Toniná our path paralled a wooded ravine, a likely spot, so I thought, for *Heliocereus heterodoxus*. Accordingly, after we had found "posada," and rested awhile, I made tracks to this ravine. No sooner had I reached the edge when, lo and behold, there was Heliocereus clambering over the tree trunks, (see Fig. 61).

Standley's *H. heterodoxus* was collected on Feb. 21. Here at Toniná, on Jan. 18, I found no open flowers. A large bud, collected with part of the stem, opened a few days later however, and the following measurements were obtained: ovary 21 m.m., tube 40 m.m., perianth lobes 38-47 m.m. The Standley and Steyermark measurements for *H. heterodoxus* are: tube 7 c.m., interior segments of the limb 3.5-4.5 c.m. No mention is made of the ovary, but since the overall length of the flower is given as 8-11 c.m., it seems reasonable to assume the length of the ovary was included in that of the tube. Plants observed at Toniná had three angled stems. Standley and Steyermark state that the stems on the type plant were complanate, but that other collections had three angled stems.

When, early in the morning of the third day, we returned from the summit, the water in the irrigation rills of Toniná had receded during the night, leaving a thin sheet of ice suspended in the grass along the edges. Freezing temperatures are a normal occurrence in Heliocereus habitats during the months of November, December, and January, but I think that frosts are not likely during the flowering season of March, April, and May. The indications are that *Heliocereus heteroxodus* blooms earlier than other species in the genus.

I believe no other cacti equal the floral brilliance of the Heliocerei. It is unfortunate they do not grow easily, everywhere. That they can be grown and flowered to perfection in Mexico City, was ably demonstrated by Dr. Iwersen.

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SPINE CHATS

LADISLAUS CUTAK

Turner Falls, in south central Oklahoma, intrigued me for the first time in 1935. The fascination was so great that I made up my mind to sojourn there when the next opportunity came. Three years later, the wish became a reality. Gus Bantel and I camped above the falls to make a plant survey of the region. We scoured the hills for hedgehog and pincushion cacti, which, we were told, existed in the Arbuckles. On the road to Price Falls, another scenic attraction in the vicinity, we looked over a likely limestone exposed hill and were rewarded with a few small specimens of the lace cactus, *Echinocereus Reichenbachii*. Only one clump of *Coryphantha vivipara* came to our attention.

Last July, Dr. George L. Berry of Lawton invited Fred Henze and me to his home and suggested a few cactus hunting trips in western Oklahoma. Howard Gates and his wife were to come in from California to join us. The meeting would give Howard and me an opportunity to discuss plans and preparations for the Denver convention next year. A few days prior to our departure a wire informed us that Dr. Berry was stricken ill, necessitating bedding for a month. Since our plans had been made I informed Gates over long distance that we would continue on to Lawton as scheduled. Convention plans were discussed at a motor court and two visits were made to the Berry home. After a brief cactus hunt near Medicine Park for *Echinocereus Baileyi* Henze and I drove to the Arbuckle Mountains below Davis. Our destination, of course, was the picturesque Turner Falls and a chance to hunt for the lace cactus.

Echinocereus Reichenbachii is probably one of the commonest hedgehogs in existence. Since there are no laws protecting this plant in the states where they grow, they have been carted and trucked out in immense quantities for disposal at the dime stores throughout the country. The same hill, which I explored for the lace cactus in 1938, was again chosen. A careful search revealed a number of small *Coryphantha vivipara* on top of the hill but the lace cactus was found about half-way down the slopes. Although both species were somewhat plentiful none of them were what you could call large. However, Fred Henze did find beautiful clusters on another hillside.

Echinocereus Reichenbachii is a cactus that can be handled without fear. Its spiny armament is more or less appressed to the plant body and therefore the spines do not pose a problem in handling. In the hundred plants examined, the normal count of ribs was 17. These were low, surmounted with close elliptic areoles, densely white woolly at first, and bearing whitish pectinate spines with brownish tips. The spines were all radial, variable in length, the lateral being longest, up to 6 mm. long, and 25 to 30 in number. Although the blooming season was long past, a description of the flowers from a previous collection will suffice. The lace cactus bears fragrant blossoms, up to 7 cm. long and 6 cm. broad. The ovary and tube are bright green, shading into brownish green just below the floral envelope. Areoles on the tube and ovary are filled with white wool and several (about 15) white to red bristles. The outer perianth segments are narrow with a dark greenish stripe through the middle showing on the underside. The inner perianth segments are of a deep rose color, erose at the broadened apices, and with pale reddish bases. The white style is surmounted by 11 to 13 green stigma lobes.

* * *

Reid Moran described a new species of Dudleya from near the mouth of Aliso Canyon in the San Joaquin Hills of Orange County, California, in the Sept.-Dec., 1949, issue of Bulletin, Southern California Academy of Sciences (48:105-114). This new species, *Dudleya stolonifera,* is said to be locally abundant and is the only one known to be stoloniferous. It is also remarkable for the broad low calyx and the combination of erect petals and spreading predehiscent carpels. Moran also reports and describes a hybrid, supposedly between *Dudleya edulis* and *D. stolonifera,* since the hybrid has been found only where the two parent species grow together.

* * *

M. B. Raizada, assistant botanist of the Forest Research Institute, Dehra Dun, described a new species of Ceropegia in Indian Forest Records (3:121-122, 1940). This new species, *Ceropegia borii,* is allied to *C. hirsuta* var. *stenophylla* but can be distinguished from it by the practically glabrous leaves and the characteristic hemispherical corolla-head which is fringed with long purple hairs. It is a herbaceous twiner composed of several fleshy conical tubers and slender, purple tinged stems. The distant, opposite, oblong-lanceolate leaves are slightly ciliate on the margins. Flowers usually 1-5, in axillary, umbellate cymes.

* * *

Prof. Edna L. Johnson and Dorothy B. Kingsbury set up experiments to determine how growth, vegetative reproduction, and histological development of the stem tissues of *Kalanchoe* (Bryophyllum) *tubiflora* were effected by exposure to different intensities and qualities of light as supplied by fluorescent light tubes, and supplemental artificial light. *Kalanchoe tubiflora* was chosen because it is well adapted to a study of responses to various environmental factors. Bi-weekly measurements over a period of 14 weeks showed an increase in height with a decrease in intensity of light. Plants grown under normal daylight produced no plantlets during the 14 weeks of observation, but under blue light the greatest number was developed. Long duration of light is an influencing factor in plantlet formation. For other developments I refer you to University of Colorado Studies, Series in Biology, No. 1, June, 1950.

* * *

Dr. Albertus Geyer, recently appointed High Commissioner for South Africa in London, has given his valuable collection of Succulent plants to Stellenbosch University Botanic Garden. Dr. Geyer and his wife have for many years been collecting Succulent plants, in which South Africa is so rich. In their garden in Cape Town they had over 150 species and varieties of Stapelia, and a Lithops variety, found in Namaqualand, has been named for him, *Lithops Geyeri.*

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CEREUSLY SPEAKING

(Continued from page 140)

well in glazed as well as clay pots. It drapes its pendent stems over the edge of the pot in soft green flower-like beads which develop graceful beads of golden yellow fragrant flowers (and I do mean fragrant even if this is not mentioned in books I've read). The perfume has the dandelion-madonna-lily combination of odors. Delightful in early morning and evening. The blooming season covers from a month to six weeks of profusion. It's a show plant and up-to-date I've had very few visitors that failed to ask about it and not try to buy cuttings. It grows fast from seed (self fertile blooms), stem cuttings and rosettes. It grows best when watered sparingly and given some shade. It is well to keep several growing as it often follows the usual Sempervivum type of dying after it blooms. This is a real "plant of the month." I hope you have it, too.

JOHN E. C. RODGERS

FORMER CACTOPHILE SEES THE WORLD

EDITOR'S NOTE: Recently we asked Dr. Yale Dawson where he had been and where he was going. He always sees a few cacti on his whirlwind search for algae.

"During the ten days before Christmas the Velero IV made a trip to Guadalupe Island, Mexico, for the purpose of making topotype collections of the marine algae described from there twenty years ago, to investigate the marine climate as it affects the growth of vegetation in the intertidal zone, to make similar collections of marine invertebrates, and to photograph the sea elephant herd. All of these plans were satisfactorily fulfilled. Land plant collecting consisted of securing a few specimens of *Talinum guadalupense!*

"Over New Year's day I took my family on a ten day excursion to the south of Punta Baja in the vicinity of Rosario, Baja California, for the purpose of making collections of algae in the cold-water upwelling areas south of some of the major headlands along the coast. We also made a station at San Quintin Bay which proved extraordinary, for we discovered a giant new species of *Codium,* an alga which consists of a single, branched, continuous multinucleate cell about 25 *miles* long without cross-walls! This new species is several times as large as the largest coenocyte thus far on botanical record (74 dm. long).

"My plans for attendance at the Seventh International Botanical Congress in Stockholm were most successful. I spent from about June 17 to August 8 in Europe visiting botanical institutions and particularly algaria in England (Kew, British Museum, Manchester), France (Museum of Paris), Italy (Dt Toni algarium, Brescia), Denmark (Botanical Museum), Sweden (Lund University, Uppsala, Marine Botanical Institute at Goteborg, etc.). Fortunately for my interests, the Congress was being held in the center of the marine algological world."